Name:________________ Date:____________

Colligative Properties Salt Lab

Purpose

The purpose of this lab is to examine different salts used to melt ice on sidewalks and roadways. You will determine which is most effective.

Hypothesis

We are testing three different salts you can buy at the store: sodium chloride, potassium chloride, and calcium chloride.

Which do you think will be most effective to melt ice?

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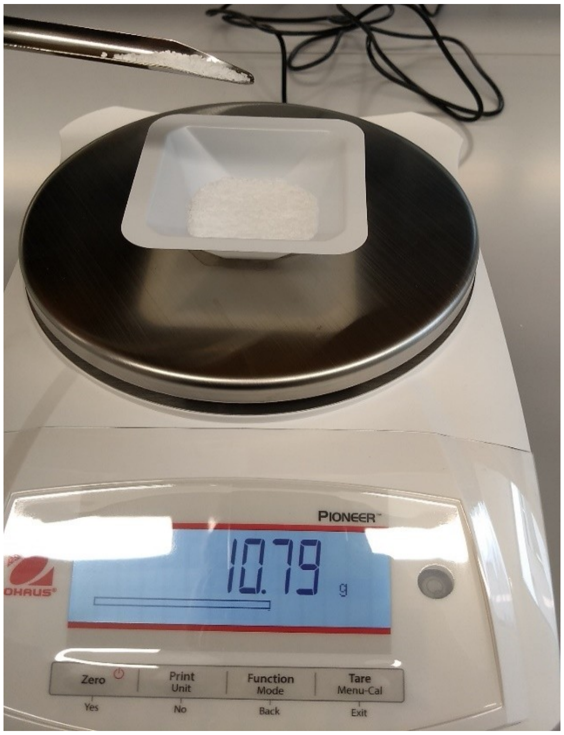
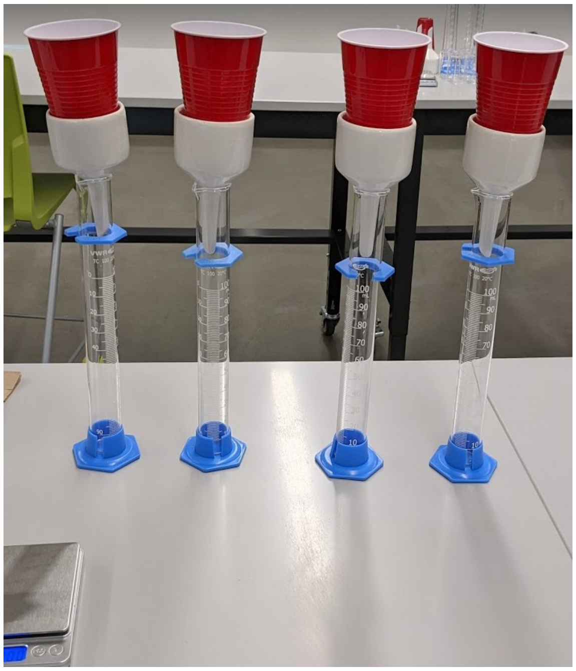
Procedure

1. Add about 10 ml of water to each graduated cylinder so that the water is at the lowest line on the graduated cylinder.
2. Measure out 10-11g of each salt using a weigh boat and balance: sodium chloride, potassium chloride, and calcium chloride. (See picture below)
3. Get four funnels (One funnel set-up is used for each salt, and one will not have any salt to be used as a control in this experiment.)
4. Fill each funnel equally with ice.
   Place the funnel on top of a graduated cylinder. (See picture below)
5. Pour the salt on each of the funnels full of ice and record the volume of water collected every two minutes for 14 minutes.





Name:________________ Date:____________

Data

Time (min)	Volume melted no salts (mL)	Volume melted NaCl (mL)	Volume melted KCl (mL)	Volume melted $CaCl_2$ (mL)
0				
2				
4				
6				
8				
10				
12				
14				

Graph

Name:________________ Date:____________

Conclusion

Explain what the graph tells you about these salts. Which is most effective? Which is least effective?

Post lab questions

1. Give at least 3 'real world' uses of colligative properties.
2. What mass of $Be(NO_3)_2$ must be added to 4.3 L of distilled water to depress the freezing point to -10.0°C?
3. What mass of $CH_3CH_2CH_2CH_2OH$, must be added to 8746 mL of distilled water to depress the freezing point to -38.0°C?

Use the information gathered here to complete a full lab report using the AET lab report template found on Schoology.

Your lab report should include:

- **Title page (With a descriptive title not just "salt lab")**
- **Table of contents**
- **Purpose**
- **Hypothesis**
- **Background**
  - **In your background make sure to explain colligative properties of solutions as they Relate to the lab (cite your sources)**
  - **Research and identify the common uses for the salts used in this experiment.**
- **Materials**
- **Procedures (rewrite the procedures in a clear easy-to-follow format)**
- **Data**
- **Calculations and graphs**
  - **Include in your calculations the average rate of melting for each salt)**
- **Conclusion**
  - **Explain what the graph tells you about these salts. Which is most effective? Which is least effective?**
- **Sources of error**
  - **Errors and how you would fix them.**
- **Post lab questions**
  - **Rewrite the questions in italics, then answer the question in complete paragraphs.**
  - **Show your work for the calculations**